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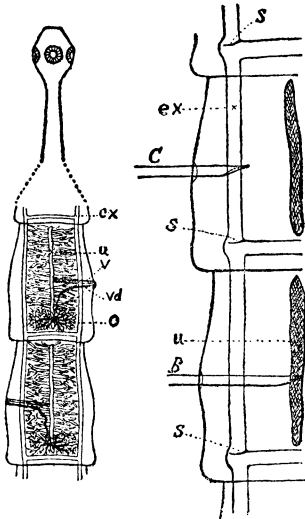
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THE TAPE WORM.

Methods of Preparation for the Museum and the Microscope.

BY J. M. STEDMAN, Cornell University, Ithaca, N. Y.

Hoping that it may be of benefit to others, I venture to give some methods by means of which I was enabled to preserve a tape-worm (*Tænia saginata*, Gœze, *T. medio-canelleta*, Kuch.), and at the same time show its anatomy most beautifully.



For museum purposes, the excretory (water vascular) system (ex) of the whole worm, or the latter part of it in which the uteri are fully developed, is injected with a fine injecting mass, such as is used for the injection of cold-blooded vertebrates. This can readily be accomplished by inserting the end of a canula (C), which should be cut off obliquely, into the generative cloaca or opening of the vagina (v), in which operation the excretory canal (ex), will be cut, and if the canula be not inserted too far, the whole of the excretory system caudad of the canula will be injected without any difficulty. This operation of injecting will demonstrate the presence of valves (s) in the canals at the caudal part of each proglottid or segment of the worm. Thus it is that only that

portion of the excretory system caudad of the insertion of the canula will be injected, the valves (s) preventing the flow cephalad. The worm, after being injected, is then washed in water and put into 75 per cent. glycerine to which has been added a few drops of acetic acid. In the course of a few hours the worm will become transparent, and in addition to the excretory system, the uteri (u), ovaries (o), vagina (v), and vas deferens (vd), which change but little, if at all, will be distinctly seen. If a worm or a portion of it thus treated be suspended in a bottle of 75 per cent. glycerine so as to be easily seen, and the bottle thoroughly corked, the specimen will keep indefinitely. A tape-worm thus prepared, is, indeed, a beautiful as well as instructive object.

For microscopical purposes about five centimeters of the worm treated the same as for the museum was mounted in glycerine-jelly in a cell in the usual way. Another portion had the uteri (u) and ovaries (o) of several of the segments also injected. The operation of injecting the uteri and ovaries is very simple, and is readily accomplished by forcing the canula (B) further in than in the case of injecting the excretory system, so that the canula reaches nearly the center of the segment. Occasionally the uteri can be injected by forcing the canula but a little way into the vagina (v). Segments in which the uteri are fully developed and extended with ova need not be injected, as they are quite distinct, but the ovaries and the immature uteri are not seen well unless injected. A few centimeters of the worm in which the excretory system is injected with one color and the uteri with another, form very beautiful preparations.

Another preparation for the microscope was made by placing a few segments of the worm in Müller's fluid for three days, after which it was injected, both the excretory system and the uteri (for unless the uteri are injected they will not be seen in this preparation), then hardened in 50,

75 and 95 per cent. alcohol, cleared in turpentine three parts, carbolic acid two parts, and mounted in balsam. These preparations in balsam require more work than those in glycerine, but it may pay in the future, the greater permanence compensating for the extra labor.

Mature segments of the worm were hardened in Erlick's fluid and alcohol, and cut into transverse, and longitudinal serial sections. The longitudinal sections show the valves (s) of the excretory system in their natural position.

The nervous system may also be studied by means of sections.

Ova were taken from the last segment, placed in picric acid and alcohol (50 per cent. alcohol, 100 cc: picric acid, 1.5 grammes,) for 30 minutes, and mounted in balsam.*

The only published methods of which I am acquainted for the preparation of the tape-worm, is in "*Manuel de Microscopie Clinique*," par G. Bizzozero et Ch. Firket, in which a process consisting of drying is described.

* Each statement made in this article was illustrated by a mounted specimen.